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PROPOSED PROGRAMME BUDGET FOR THE BIENNIUM 1994-1995

United Nations telecommunications system

Report of the Secretary-General

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INTRODUCTION

1. It will be recalled that, in 1989, the Plenipotentiary Conference of the International Telecommunication Union (ITU) decided by its resolution COM 8/1:

> "that the United Nations telecommunications network may carry the traffic of the specialized agencies which participate voluntarily on condition that the specialized agencies would pay for the telecommunications service based on the expenses of operating the service by the United Nations and tariffs, established by administrations within the framework of current regulations and practices;".

2. In keeping with this resolution, at its Board of Governors meeting in September 1992, the International Telecommunications Satellite Organization (INTELSAT) lifted the restrictions on the development and operation of a United Nations global satellite network. On 11 March 1993, the Secretary-General of the United Nations and the Director-General of INTELSAT signed an amendment to the agreement for the leasing of space segment capacity, which authorized the expanded use of INTELSAT satellites by the United Nations. As a result, the United Nations is in the unique position of being able to extend to the United Nations common system the efficiencies and economies of its own network.

3. Recognizing the importance of telecommunications in the daily operations and management of the United Nations common system, the Secretary-General presented a report on the status of telecommunications activities in the United Nations (A/C.5/46/5). In part B, section V, of resolution 46/185, the General Assembly, inter alia, took note of the report of the Secretary-General and endorsed the comments and recommendations of the Advisory Committee on Administrative and Budgetary Questions (ACABQ) contained in its report (A/46/7/Add.12). ACABQ indicated that the operational arrangements for implementation of a private global network needed to be further developed together with detailed cost estimates, in close consultation with the specialized agencies. The Committee also recommended that at such time as the operational plan was clearly worked out and agreed to by the specialized agencies, a comprehensive proposal for expansion of the existing telecommunications network should be submitted in a report to the General Assembly, including the implementation schedule, cost estimates and plan of financing.

4. In view of the significant savings that could be achieved from the implementation of the satellite network, in April 1993, a report was submitted to ACABQ proposing a satellite backbone network to meet current urgent requirements of the United Nations, including the total project budget, cost-benefit analysis and implementation schedule. Following its review of those proposals, the Advisory Committee, while welcoming the benefits outlined in the report, indicated that final approval of the proposals would have to be sought from the General Assembly at its forty-eighth session. The present report includes additional information that the Committee indicated should be presented to the Assembly.

5. The proposals outlined in the foregoing paragraphs relate to the installation of seven Earth stations: one each at the seat of the regional

commissions at Addis Ababa, Bangkok, Santiago and Amman; one at the United Nations Office at Nairobi and two at the United Nations Office at Geneva. It is designed to meet the United Nations own requirements, and would enhance connectivity between United Nations Headquarters and its regional commissions and field offices, as well as with the specialized agencies. The network would also be expanded and configured to meet peace-keeping and humanitarian requirements. In some cases, the satellite would replace existing leased circuits and in other areas it would work in conjunction with commercial fibre-optic terrestrial systems and digital microwave communications links.

6. Based on an implementation schedule of approximately three and a half years starting in 1993, it is estimated that the total project cost would amount to $18,212,700, of which $9,306,600 relate to the one-time cost of the installation and integration of the enhanced telecommunications system and $8,906,100 to the operation and management of the network. Of the total cost required, however, it is estimated that $4,272,600 could be met from existing resources currently allocated to telecommunications under the regular budget, $9,537,700 from savings to be derived from communications requirements of the peace-keeping missions and $412,200 from reimbursement obtained from specialized agencies and other extrabudgetary programmes for the use of the United Nations telecommunications network. It is further anticipated that the additional cost, estimated at $3,990,200, would be offset in part by savings of $578,800 under the regular budget for the rental of leased circuits, which are expected to be realized if the implementation of the network proceeds without delay.

7. The net additional cost under the regular budget, estimated at $3,411,400, has been included in the respective sections of the Secretary-General's proposed programme budget for the biennium 1994-1995.

I. BACKGROUND AND APPROACH TO THE SATELLITE NETWORK

A. Present status of the United Nations telecommunications network

8. Presently, the United Nations uses leased analog alternate voice and data (AVD) circuits, leased digital circuits for integrated voice and data services and a number of United Nations-owned satellite Earth stations operating on the INTELSAT system. The leased circuits provide most of the administrative telecommunications services between Headquarters, the regional commissions (Economic Commission for Europe (ECE), Economic Commission for Asia and the Pacific (ESCAP), Economic Commission for Latin America and the Caribbean (ECLAC), Economic Commission for Africa (ECA), Economic Commission for Western Asia (ESCWA), United Nations Office at Nairobi, the United Nations Development Programme (UNDP)) and other United Nations offices. The satellite portion of the network encompasses United Nations-owned satellite Earth stations ranging from 1.8 to 11 metre antennae, with circuits operating under a lease agreement with INTELSAT. The satellite network is jointly operated by the Electronic Services Division of the Office of General Services and the Field Operations Division of the Department of Peace-keeping Operations. While the satellite network supports mostly peace-keeping needs, some operational traffic is also routed over the network. Both the leased lines and the satellite networks rely on the use of commercial facilities through major carriers including the facilities of the International Maritime Satellite Organization (INMARSAT). The

private network and commercial facilities provide voice, data, telex, facsimile and cablegram facilities, including both standard and cryptographic capabilities. The networks are also shared with some of the specialized agencies and other United Nations users.

9. Owing to the high operating costs of commercial services, the inherent limitations of the AVD circuits and the lifting of the ITU and INTELSAT restrictions, the United Nations is now concentrating its efforts on converting its many services to a United Nations-owned totally integrated digital satellite network that will provide a rapid, reliable and economic solution to its communication requirements.

B. Network options considered

10. Following the General Assembly's consideration of the report to the forty-sixth session, the Electronic Services Division, in close association with ITU, carried out a study addressing the cost-benefit analysis and service-quality issues of a private global integrated telecommunications network which would be available to the United Nations and the specialized agencies. Several options were examined to meet the telecommunications requirements of the United Nations system. The question of whether a private United Nations network was desirable and, if so, what network technologies were viable, taking into account the various implications (technical, financial and managerial) was also addressed. The three basic options considered in a cost-benefit study undertaken by a consultant were as follows: (a) a fully commercial network; (b) a private leased-line network combined with commercial services and (c) a private satellite network combined with commercial services. The respective characteristics of the three network options are indicated below:

(a) Commercial carrier network. The commercial carrier network requires a very small capital investment cost but gives rise to substantial recurring charges that are directly proportional to usage. The higher the usage, therefore, the higher the costs. The cost of services on a fully commercial network is strictly dependent on traffic volumes and can be considered as a straight-line projection, with the unit charges remaining essentially constant. Since the volume of United Nations traffic is high and relatively predictable between Headquarters and overseas offices, a fully commercial network will not be well suited to the United Nations. Furthermore, commercial services are either limited or not available in most peace-keeping locations, such as the United Nations Operations in Somalia (UNOSOM) or the United Nations Protection Force (UNPROFOR) in Zagreb. The commercial carrier option becomes even less attractive if the traffic of the specialized agencies is considered;

(b) Leased-line network. The leased-line network has fixed charges for each line, regardless of usage. The leased-line network is combined with commercial services, with charges based on usage, for those locations not accessible on the leased-line network. This is a cost-effective network when the bulk of the traffic is predictable and primarily point to point. Although this configuration represents the current United Nations network, it is not adequate to meet the Organization's growing telecommunication requirements. An expansion of the leased-lines to meet these requirements would still leave many areas without coverage;

(c) Satellite network. Satellite networks are not subject to the limitations of a point-to-point leased-line network. The satellite network solution will allow rapid network deployment, instantaneous and flexible connectivity between Earth stations over vast geographic locations for peace-keeping missions and any other United Nations telecommunication requirements at short notice. As a result, a larger proportion of traffic will be handled on the United Nations network and a smaller proportion will be subject to commercial charges. The higher the volume of traffic on the United Nations-owned network, the lower the unit cost. This configuration is cost-effective for organizations with high volumes of traffic from multiple sources. While a satellite network requires substantial initial capital investment, for both equipment and installation, recurring costs for the operation of the network over its useful life are low.

11. Following the consideration of a variety of technologies, the study concluded that a satellite-based telecommunications network with a terrestrial back-up would be the most cost-effective configuration for the United Nations. The satellite-based network would not only be most cost-effective but would also provide the quality and range of service desired by the United Nations.

C. Participation of specialized agencies in the development of the network

12. The specialized agencies' involvement with the concept of a satellite network for the United Nations common system goes back to 1991 when the United Nations presented the concept of a satellite-based network to the technical panel on telecommunications of the Advisory Committee for the Coordination of Information Systems (ACCIS) in the context of a report entitled "The United Nations telecommunications strategy paper". The strategic direction outlined in that report was that the best approach to providing transmission facilities for the network, both technically and economically, was to use United Nations-owned Earth stations and satellite transponder capacity leased directly from INTELSAT. That approach gave technical latitude in design and system implementation and was the least expensive of all possible alternatives. The concept of a satellite based network was well received by the specialized agencies who expressed interest in participating in the network once established.

13. On 18 May 1993, 14 representatives from the United Nations common system participated in the inter-agency meeting on telecommunications plans, which was convened by the United Nations in New York. Presentations on the development of the network were given by the United Nations, ITU and INTELSAT, followed by discussions on the telecommunications plans and requirements on the part of the other United Nations programmes and specialized agencies.

14. A significant result of the meeting was the establishment of an overall framework for the coordination of telecommunications activities on the part of the United Nations and the specialized agencies. It was agreed that an inter-agency coordinating committee on telecommunications would be established to ensure that full cooperation was achieved in meeting the telecommunications requirements of the common system and that two inter-agency working groups would be established: one, chaired by the United Nations, would monitor the development of the United Nations backbone satellite network; and the other,

chaired by the Office of the United Nations High Commissioner for Refugees (UNHCR), would plan and develop the telecommunications requirements of the field agencies at the local level. The initial meetings of each of the two working groups took place in New York on 7 and 8 July respectively. The next meetings are scheduled for late 1993.

15. Although the other organizations are participating in the discussions for the development of a global telecommunications network, at this point, most organizations are not prepared to finance a global telecommunications network before it becomes operational. On the other hand, since the Secretary-General believes that an improved United Nations telecommunications network will not only be cost-effective but will also be responsive to the daily operations of the United Nations in such vital areas as peace-keeping operations, humanitarian activities and preventive diplomacy, the improvement of the United Nations telecommunications system, geared exclusively to the needs of the United Nations, is being proposed. The proposed backbone satellite network and its facilities would also benefit other organizations within the common system since these would be made available to those organizations on a reimbursable basis, including a 1 per cent add-on charge to the United Nations unit rate to recover the capital costs of the network.

D. Objective of the proposed satellite network

16. The ultimate goal of the network is to improve the availability and efficiency of a global integrated digital telecommunications system with the capability of supporting voice, telex, facsimile, electronic mail packages, data communications, documents handling and video-conferencing over the same network. Other goals are to reduce expenditures on commercial carrier networks and to minimize the security risk in the field by operating, as far as possible, independent telecommunications facilities.

17. The initial phase of the satellite network would link Headquarters with the regional commissions and the United Nations offices at Geneva, Vienna and Nairobi and would in addition provide a telecommunications highway for peace-keeping missions, no matter where these may be located. This is the proposed backbone network.

E. Subsequent phases

18. The network would be developed gradually. The first phase would be the implementation of the proposed backbone network upon which the feeder network will be connected. The subsequent phases would be the installation of small Earth stations (feeder network) to serve other overseas offices of the Organization and of other organizations in the common system. These installations would be justified on the basis of the level of traffic generated. The specialized agencies' requirements could, therefore, be met as the network develops. Small Earth stations would thus be installed on demand by these agencies provided the Earth station meets the global network specifications. It is against this concept that the Inter-agency Coordinating Committee on the development of the United Nations global satellite telecommunications network, mentioned above, was established in May 1993.

F. Analysis of telecommunications traffic

19. The United Nations maintains detailed records of its outgoing telecommunications traffic from Headquarters to overseas destinations. However, records of traffic from overseas offices to Headquarters and between overseas offices are sparse and often not available. Voice traffic from Headquarters is recorded in a number of ways. For example, traffic is recorded by destination, so that the number of minutes and charges for each destination for telephone or facsimile can be identified. Records are also maintained by user organizations or departments and are divided between those units that are charged for services and those that are not. Furthermore, the traffic is recorded by carrier and charges for all commercial carriers are maintained. Similar records are maintained for telex and cable messages.

20. Currently, on average the United Nations experiences some 5 million minutes of voice traffic per year of which 2.4 million minutes are from Headquarters over commercial carrier networks. This traffic costs the Organization approximately $4.2 million annually. As regards peace-keeping operations, the estimated annual telecommunications expenditures of $15 million is obtained from actual invoices from peace-keeping missions. The charges from INMARSAT and national posts and telecommunications authorities average $6.50 to $7 per minute in support of peace-keeping missions. From this, the traffic volume of 2.3 million minutes is derived. The higher costs experienced by the peace-keeping missions are due to the relatively high rates charged by INMARSAT and the local authorities for international calls.

21. To be able to carry out more complete traffic data analysis for network costing, a number of procedures will be introduced. The new digital private automatic branch exchange (PABX) switches being installed at overseas offices will be programmed to collect traffic data automatically. Direct measurement of traffic data on outgoing lines connecting all United Nations switches with public networks, leased lines and the collection of traffic data from public operators will be established in the network system. The results of future traffic analysis will be used to review the network costing and tariffs.

G. Comparison of rates between commercial carriers and the United Nations network

22. In order to assess the savings derived from the use of the United Nations telecommunications network, comparisons of the rates charged by commercial carriers and those charged by the organizations have been prepared (see annexes I and II). For a valid cost comparison between a commercial carrier and the United Nations network, the rates of the respective networks to the same destinations were examined. The current United Nations network covers 18 destinations. Additional destinations would be phased in under the satellite network. The Organization's network rates are based on recovering the costs of operation of the service and on tariffs established by administrations, in accordance with ITU resolution COM 8/1. Annex I compares the rates for telephone service originating from New York charged by commercial carriers versus the rates charged by the Organization. It should be noted that the rates indicated under "commercial rates" represent an average of several commercial

carriers. Annex I also shows the rates for outgoing calls from the New York telephone switch to destinations on the leased-line network. As indicated in that annex, incoming calls to New York and other destinations via the national posts and telecommunications authorities are much higher. Incoming calls to New York from various duty stations, which are intended for destinations beyond New York, are routed via the United Nations leased circuits. In these cases, the rate charged is the rate from New York to the final destination. Annex II compares the charges for telex traffic among duty stations with the United Nations rates. Under the column headed "New York" a comparison of the average commercial rates and the United Nations rate from Headquarters on the United Nations network to other duty stations is shown.

23. The conclusion drawn from these annexes is that a fully commercial network would not be cost-effective for the United Nations and that significant savings could be derived from the operation of a private telecommunications network.

II. ENGINEERING OF THE PROPOSED SATELLITE NETWORK

A. Review of services available from satellite system providers

24. In order to determine the most cost-effective satellite network that would meet the Organization's expanding telecommunications requirements, a comprehensive review of the two primary services available from satellite system providers was carried out, namely, the INTELSAT international business service (IBS) and the very small aperture terminals (VSAT) service. IBS is a totally integrated digital service designed to meet the private network needs of multinational corporations and organizations. This service supports voice, data, facsimile, telex and video-conferencing. The VSAT-type network is generally designed to provide data communications between a single large hub Earth station and multiple smaller Earth stations at an unlimited number of remote sites. VSAT networks are in common use in meeting business and financial industry needs, for example, for hotel reservations and credit card verifications, etc., and are particularly effective in covering large data network requirements.

25. The United Nations telecommunications requirements consist of different types of services at widespread geographic locations and cannot be met independently by the IBS or the VSAT network solution alone. Therefore, an appropriate mix of both IBS and VSAT network would be used as and when required. The IBS network would be used for the heavy traffic routes, i.e. the backbone satellite network, thus avoiding multiple connections through individual leased lines (AVD circuits). In order to respond to the diversity and ad hoc nature of peace-keeping activities and the specialized agencies' needs, the VSAT network would be used.

B. Network design considerations

26. The overall network design concept is presented in figure 1. As far as possible, in each of the identified countries, satellite Earth stations will be installed on United Nations premises with ground communications equipment housed together with other backbone nodal equipment, such as PABX, multiplexers and

packet switches. The exact locations of the equipment will be determined by consultation and agreement with individual United Nations offices.

27. Full connectivity of the United Nations telecommunications network will require the use of three geostationary satellites with three hub stations, one located at United Nations Headquarters in New York, one in Geneva and the third in East Asia to access the Atlantic Ocean region, the Indian Ocean region and the Pacific Ocean region satellites respectively. However, as short- and medium-term solutions, it is suggested that the Earth station at Headquarters be upgraded to serve as the primary hub station for the Atlantic Ocean region satellite and a second hub station will be installed in Geneva for the Indian Ocean region satellite. As an alternative to the North Atlantic fibre-optic cables currently used, a second Atlantic Ocean region satellite Earth station will be installed at the European hub. However, a single fibre-optic cable link will be retained to carry delay sensitive traffic and act as a back-up to the satellite network. The second European hub Earth station will not only replace the European/New York fibre-optic cable, but will serve as a major transit hub station for peace-keeping by providing direct communications to United Nations offices and specialized agencies in Europe.

28. The location and implementation of the third hub Earth station to serve the Pacific Ocean region satellite will be determined after further investigation of traffic patterns in that part of the world. Schematically, the connectivity plan of the proposed network is as depicted in figure I.

European hub Earth stations

29. The European hub Earth stations will provide connectivity to African, Asian, and Middle Eastern countries working on the Atlantic Ocean region and Indian Ocean region satellites. The hub stations will also serve as a collection centre for all current and proposed European leased circuits to Headquarters, i.e., Vienna, Copenhagen, Paris, Rome and London.

30. An alternative to the European leased circuits is the installation of Earth stations at these locations. However, further detailed study of traffic volume would be needed before installation of individual Earth stations at these locations could be justified.

31. The European hub stations will have the capability of not only providing services to ongoing peace-keeping missions such as UNOSOM and UNPROFOR, but also to all future peace-keeping operations. This will substantially reduce INMARSAT and local national posts and telecommunications authorities charges for long-distance telephone calls between field missions and Headquarters. With the installation of the European hub stations, the need to build a hub Earth station for each new peace-keeping mission will almost be eliminated.

Addis Ababa, Nairobi and Santiago

32. The regional commissions at Addis Ababa and Santiago and United Nations Office at Nairobi, as well as the specialized agencies, will be connected via the Atlantic Ocean region satellite directly to either United Nations Headquarters in New York or to the European hub Earth stations. Onward transmissions will be routed on leased circuits or commercial carriers services

to the final destinations. At each of the regional commissions, telecommunications services between subregional field offices and the regional headquarters or home offices will also be possible.

Bangkok and Amman

33. ESCAP and ESCWA and other United Nations offices in Amman and Bangkok will be connected to United Nations Headquarters via the European hub stations, using both the Indian Ocean region and Atlantic Ocean region satellites. While an alternative connection for these stations would be through the Naqoura Earth stations, given the United Nations traffic volume and the availability of the North Atlantic fibre-optic cable as back-up, the European hub will be used as the primary transit route.

III. ORGANIZATIONAL AND MANAGEMENT STRUCTURE

34. The major challenges of managing the enhanced digital telecommunications network are the need to provide continuous operation and availability of services at the lowest reasonable cost to end-users. Included in the cost element is the plan to operate the proposed satellite backbone network with a minimum staffing approach consistent with the required continuity of services. This in turn means that the backbone network hub Earth stations in New York and Europe will be a 24-hour operation with minimum shift staffing. The remaining Earth stations at the regional commissions and Nairobi will operate unattended during the evening and night shifts.

35. To support the foregoing operational plan, a fully integrated monitoring, alarm and control system is designed into the network and will be installed in New York and at the European hub Earth stations. The system will monitor and control all major equipment units to ensure continuous unattended operation with automatic changeover of faulty units by remote control from New York or the European hub stations.

36. In addition, a centralized personal computer-based spare parts management system will be administered from New York. The system will monitor spare parts and equipment units, with manufacturer and part or unit reference number, at each Earth station. The system will also contain reordering procedures.

37. The telecommunications network, including the proposed satellite backbone network, will continue to be under the control of the Department of Administration and Management of the Secretariat. Planning, engineering, procurement, billing and charge back, staffing and day-to-day management will continue to be in the Office of General Services. Close coordination with the Department of Peace-keeping Operations will continue so as to ensure full support to the peace-keeping missions. Supervision of the peace-keeping field telecommunications will continue to be under the control of the Department of Peace-keeping Operations.

38. Telecommunication management at the regional commissions and Nairobi is currently under the respective building management units of those offices. In most cases, messaging services are provided by field service staff of the Field Operations Division funded by the regular budget and outposted to those duty

stations. Practically all functions of the building management units pertaining to telecommunications services management at those locations are administrative in nature and are, therefore, inadequate for the effective operation and maintenance of the complex internetworking telecommunications systems that are currently being installed or expected to be installed at those offices.

39. For efficient management, operations and maintenance of the United Nations telecommunications system, which needs to be responsive to the demands of peace-keeping and humanitarian activities and the extensive exchange of administrative communications taking place among various duty stations, it is proposed to strengthen the Telecommunication Services Section at the Office of General Services/Electronic Services Division and to establish a separate telecommunications services at each regional commission and Nairobi unit with responsibility for system engineering, operation and administration.

40. The main functions of the proposed telecommunications services units will be the overall management of the telecommunication services and system engineering aspects. In close coordination with the Office of General Services/Electronic Services Division at Headquarters, these units will carry out planning and budgeting for the system; establish and enforce operations and maintenance procedures; administer all local telecommunications contracts and ensure system security; and carry out administrative functions such as ordering and procurement of telecommunication equipment and services, billing and charge back of client account, preparing databases of telecommunication services and users, maintaining established operational procedures, training users in new telecommunication services and operations and updating the local component of the centralized spare parts management system. An organizational structure for the proposed units has been developed, as contained in annex III.

41. The introduction of the monitoring, alarm and control system and the centralized spare parts management system have substantially reduced the number of engineers and technicians that would otherwise be required to operate the telecommunications system. Within the framework of the proposed satellite backbone network project, minimum technical and administrative staffing requirements have been identified for each of these locations and is contained in table 1 below. The use of contracted staff where available from the host national posts and telecommunications authorities, contractual staff and/or temporary assistance would be used to supplement the proposed establishment.

Table 1. Staffing matrix

STAFFING LEVEL

Site	P-5	P-4	P-3	General Service (Principal level)	General Service (Other level)	Local level	Field Service	Total
New York	1	0	1	2	1	0	0	5
Europe	0	1	0	1	6	0	1	9
Addis Ababa	0	1	0	0	0	4	3	8
Nairobi	0	1	0	0	0	4	3	8
Bangkok	0	1	0	0	0	4	3	8
Santiago	0	1	0	0	0	4	3	8
Amman	0	1	0	0	0	4	3	8
Total	1	6	1	3	7	20	16	54

42. The implementation, operation and maintenance of the telecommunications system, including the proposed satellite Earth stations, would require a minimum of 54 staff, as indicated in the matrix above, and are distributed among Headquarters and the 6 different locations as follows:

(a) Project implementation team, Headquarters: To ensure successful implementation of the satellite project, the Electronic Services Division of the Office of General Services would establish an implementing team at Headquarters consisting of a Project Manager and a Satellite Engineer at the P-5 and P-3 levels respectively, two General Service staff, one at the principal level and one project management assistant. The implementing team would ensure that the project would successfully accomplish its objectives with minimum delay and cost to the Organization. To cope with the added workload of coordination, line-ups, testing and future operations, one additional General Service staff would be required. The implementing team in the Office of General Services/Electronic Services Division would provide additional technical and managerial backstopping;

(b) Addis Ababa, Bangkok, Santiago, Nairobi and Amman Earth stations: At each regional commission and Nairobi, one manager with telecommunications engineering background (at the P-4 level) to head each Telecommunications Services Unit, supported by three technicians (in the Field Service category) and four local-level staff for administrative support would be required;

(c) European hub Earth stations: One manager with telecommunications engineering background (at the P-4 level), one technician (in the Field Service category) and seven General Service staff, one at the Principal level, would be required to provide technical and administrative support. It should be noted that there would be two satellite Earth stations in Europe and, as a result, additional support staff would be required.

43. In addition to the above, in order to provide adequate technical expert advice on the satellite network and associated systems, it will be necessary to retain individual or institutional contractors at a cost of approximately $454,200 for the 1994-1995 biennium. ITU has already indicated its willingness to provide such experts to the United Nations. Furthermore, since 1994-1995 will be the first biennium for the implementation of the enhanced network, the

workload is expected to increase progressively during this period. Therefore, it is proposed that $578,800 in general temporary assistance resources equivalent to approximately 72 General Service (Other level) work-months in New York and approximately 48 General Service (Other level) work-months in Europe and $50,000 for overtime be provided initially, with a view to regularizing the actual requirements based on experience gained as the enhanced network becomes fully operational. Additional staffing for administrative or technical back-up will not be required.

IV. PROJECT BUDGET AND IMPLEMENTATION TIMETABLE

44. The project budget, estimated on a biennial basis at current rates in the amount of $21,296,200, is shown in table 2 below. The one-time (non-recurrent) cost required for the acquisition of 7 satellite Earth stations, including the second Atlantic Ocean region satellite Earth station at the European hub, the upgrade of the Headquarters Earth stations, a satellite monitoring, alarm and control system at New York and the European hub Earth stations and a set of 15 small portable Earth stations is estimated at $9,306,600. These portable Earth stations will be used for transferring peace-keeping missions traffic from the INMARSAT satellite system to the United Nations backbone network. Based on the staffing matrix indicated in table 1 above and the technical expertise and support staff required, which are outlined in paragraph 42, above the biennial cost is estimated at $8,345,800. In addition, $3,643,800 would also be required for satellite leases. The total recurrent costs are thus estimated at $11,989,600.

45. Based on the implementation timetable outlined in the present section, the project cost for 1994-1995 is estimated at $18,212,700, consisting of the recurrent cost of staffing requirements ($5,262,300) and satellite leases ($3,643,800) and non-recurrent costs for the installation of the satellite Earth stations and related cost ($9,306,600). As shown in section V below, these costs would be more than offset by reduced transmission costs, thereby resulting in a net savings to the Organization. Details of the benefits and savings are also outlined in section V.

Table 2. Project budget for an enhanced satellite network

(In thousands of dollars)

	Project budget (at current rates)	
	Biennial costs	1994-1995 requirements based on phased implementation timetable
RECURRENT:		
Salaries and related costs	8 345.8	5 262.3
Satellite leases	3 643.8	3 643.8
Total recurrent	11 989.6	8 906.1
NON-RECURRENT:		
European hub: 2 Earth stations	2 300.0	2 300.0
Addis Ababa	479.3	479.3
Bangkok	535.2	535.2
Santiago	570.1	570.1
Amman	397.7	397.7
Nairobi	579.3	579.3
New York (upgrade)	500.0	500.0
Site preparation	600.0	600.0
15 portable Earth stations	1 500.0	1 500.0
Subtotal	7 461.6	7 461.6
System integration and installation	1 755.0	1 755.0
Training	40.0	40.0
Travel	50.0	50.0
Subtotal	1 845.0	1 845.0
Total non-recurrent	9 306.6	9 306.6
TOTAL COSTS	21 296.2	18 212.7

A. Implementation timetable

46. The proposed satellite network can be implemented in phases, which are organized in such a way as to allow an orderly integration of the improved facilities into the existing structure. For this reason, a multiphased programme is envisaged to be implemented over a period of approximately three and a half years for the preparation, system integration, installation and commissioning of facilities.

1. Phase 1. January-December 1993

47. In order to ensure that the execution of the proposed network could commence without delay during the first quarter of 1993, a staff member in the Electronic Services Division has been temporarily assigned to carry out the initial functions of the project implementation team at Headquarters. The location of the satellite Earth stations and staffing requirements for each of these locations have been identified. Detailed technical specifications of the seven satellite Earth stations, ancillary equipment and standardized operation and maintenance procedures were finalized. The request for proposals for the acquisition of the seven satellite Earth stations and related equipment in Europe, Addis Ababa, Bangkok, Amman, Santiago and Nairobi, including the upgrade of the Earth station in New York is in its final stages of preparation. This is expected to be issued to vendors in December 1993. To avoid financial commitment on the part of the Organization, prior to the authorization of the General Assembly, the necessary financial clauses have been incorporated in the request for proposals.

2. Phase 2. January-December 1994

48. During the second phase of the project, Earth stations would be installed in Europe, Addis Ababa and Bangkok, including the satellite monitoring, alarm and control system at New York and the European Earth stations. Prior to the award of contract, action would be taken at this stage for the recruitment of a core staff in each of these locations. The coordination, control, testing, commissioning and operation of the Earth stations will be carried out from the New York hub Earth station. To strengthen the operation at Headquarters and the implementing team in the field, two technicians at the General Service principal level would be required. Prior to the installation of the Earth stations, the core staff would undergo a training period with the contractor before taking over the operation of the Earth stations.

3. Phase 3. January-June 1995

49. During the next six months period, action would be taken for the recruitment of two senior technicians, one each for the satellite and the switching units, at the Field Service level and four local level staff at Addis Ababa and Bangkok and the remaining staff for the European hub station, namely, seven General Service staff, one at the principal level. The core staff would provide training for the operating technicians.

50. Earth stations at Amman, Santiago and Nairobi would be installed during this phase of the project. Prior to the award of contract, action would be taken for the recruitment of the core staff at each of these duty stations. Prior to the installation of the Earth stations, the core staff would undergo a training period with the contractor before taking over the operation of the Earth stations.

4. Phase 4. July-December 1995

51. During the next six months period, action would be taken for the recruitment of the remaining two senior technicians, one for the satellite unit and one for the switching unit at the Field Service level and four local level staff at Amman, Santiago and Nairobi. The core staff would provide training to the operating technicians during this phase of the project. An additional seven months would be required for commissioning of the whole network.

V. COSTS, BENEFITS AND FINANCING OF THE PROPOSED SATELLITE NETWORK

A. Benefits of the proposed satellite network

52. The acquisition and installation of the proposed satellite facilities would provide an effective and efficient telecommunications network for the United Nations. In summary, the benefits that the network would provide are as follows:

(a) It would take advantage of the unique status of the United Nations with respect to ITU and INTELSAT;

(b) It would establish a backbone network for peace-keeping missions; the backbone network could be accessed by missions regardless of where they may be located;

(c) The proposed satellite system will provide an integrated digital telecommunications system with capabilities of supporting voice, telex, facsimile, electronic mail, data communications, including the requirements of the Integrated Management Information System (IMIS), and documents handling over the same network, thus providing more reliable and efficient telecommunications in support of all the activities of the Organization;

(d) It would result in substantially lower operating costs as a result of savings in long-distance commercial charges by approximately $13 million per biennium;

(e) It would increase the overall capacity of the system so that traffic of other agencies could be carried on a reimbursable basis, thus resulting in lower telecommunications costs for those agencies participating in the enhanced network.

53. In addition, the installation of the satellite Earth stations will further facilitate the improvements already made in technological innovations. For example the digital PABX at Headquarters and the United Nations offices at

Geneva and Nairobi and those expected to be installed at Addis Ababa, Bangkok and Santiago will require the satellite network for continuous transmission at the lowest cost. The cost of data communications through the local area network (LAN) between Headquarters and overseas offices would be significantly reduced as a result of the installation of the satellite Earth stations.

B. Savings under the proposed satellite network

54. As indicated in paragraph 44 above, the total project budget estimated on a biennial basis would be $21,296,200, consisting of non-recurrent capital expenditures ($9,306,600) and recurrent operational cost ($11,989,600). The major expenses associated with the proposed network include: acquisition and installation of the Earth stations, site preparation, staffing for the operation of the network and the lease of additional capacity on satellites. It is, however, projected that the total recurrent costs under the proposed network ($11,989,600) would be substantially lower than the communications expenditures amounting to $42 million under the existing system, allowing the non-recurrent expenditures ($9,306,600) to be recovered in about one year.

55. As shown in table 3 below, under the current telecommunications network, the projected 1992-1993 expenditure for long-distance telecommunications by the United Nations is estimated at $42 million. As the Earth stations are installed in each of the proposed locations and as they become fully operational, the anticipated savings will begin to be realized. A comparison of the estimated 1992-1993 expenditures under the current telecommunications system, the estimated expenditures that would have been required with the enhanced satellite system and the potential savings envisaged when the total complement of the satellite network becomes fully operational are also shown in that table. The recurrent cost of $42 million required for transmission facilities would progressively be offset by savings consisting of the following: reduction of leased-line costs by $1.7 million, commercial carrier networks by $1.3 million and national posts and telecommunications authorities and INMARSAT charges by $23.6 million. These savings would be partly offset by an increase of $3.1 million required for satellite leases and $8.3 million for salaries and other charges and $9.3 million for non-recurrent equipment and related costs, or a notional $5.9 million savings for the biennium. Details of the savings are discussed below.

Table 3. Long-distance telecommunications costs and potential savings

	Estimated expenditures in 1992-1993 under present technology		Comparative expenditures for 1992-1993 under proposed system		Projected savings	
	$'000	%	$'000	%	$'000	% a/
A. RECURRENT COMMUNICATIONS EXPENDITURES						
REGULAR BUDGET						
Leased circuits	3 573.7		1 809.7		(1 764.0)	
Commercial network	8 406.5		7 145.5		(1 261.0)	
Satellite lease	510.0		510.0		-	
Total, regular budget	12 490.2	29.7	9 465.2	61.6	(3 025.0)	24.2
PEACE-KEEPING MISSIONS						
INMARSAT and national posts and telecommunications authorities	29 520.0	70.3	5 904.0	38.4	(23 616.0)	80.0
Subtotal	42 010.2	100.0	15 369.2	100.0	(26 641.0)	
B. ADDITIONAL COST OF THE IMPLEMENTATION OF THE SYSTEM						
Earth stations and related costs			9 306.6		9 306.6	
Salaries and related cost			8 345.8		8 345.8	
Additional satellite leases			3 133.8		3 133.8	
Subtotal			20 786.2		20 786.2	
NET TOTALS	42 010.2		36 155.4		(5 854.8)	

a/ Percentage of savings over estimated expenditures in 1992-1993 under present technology.

Leased circuits

56. Under existing United Nations leased circuits, the total 1992-1993 recurring expenditures are estimated at $3,573,700 for two-way leased circuits from Addis Ababa, Bangkok, Nairobi, Santiago, Geneva, Vienna and Paris to New York. The replacement of leased circuits with the satellite network for Addis Ababa, Bangkok, Nairobi, Santiago and three of the European leased circuits will eliminate recurring expenditures, estimated at $1,764,000 for the rental of these circuits, once the proposed system is fully operational. The existing and proposed leased-lines configurations are given in annex IV.

Commercial carrier networks

57. Based on expenditure patterns to date, it is estimated that the total expenditure for commercial carrier networks (cables, telexes and long-distance telephone) amounts to $8,406,500 per biennium. The complete installation of the satellite network and configuration of the digital switches will direct approximately 15 per cent of the global commercial carrier traffic to the proposed satellite network. The potential global savings for the United Nations are thus estimated at $1,261,000, under various offices.

Peace-keeping operations

58. Currently, telecommunications requirements of peace-keeping missions are being provided by the United Nations Earth stations, INMARSAT and national telecommunications networks. The costs associated with the utilization of INMARSAT terminals and national posts and telecommunications authorities network facilities are extremely high, averaging $6.50 per minute. For example, the average telecommunications cost of a peace-keeping mission, consisting of utilization of INMARSAT and national posts and telecommunications authorities Earth stations is approximately $811,000 per month. Each time a new peace-keeping mission is established it requires both domestic and international telecommunications services. These requirements are usually met by installing a hub Earth station and an international gateway exchange to link the mission activities with United Nations Headquarters and other international destinations. The installation of a 4.5 to 7-metre hub Earth station normally takes between four to six months. The capital cost for the installation of a hub Earth station and the international gateway exchange (excluding the domestic network) is in the range of $500,000. Depending on the immediate needs of the mission, its size and the urgency required for it to be operational, the hub stations and associated equipment are leased from INMARSAT or other satellite system services providers at very high cost until the mission network becomes available.

59. While it is recognized that the proposed satellite backbone network will not totally eliminate the need for the construction of hub Earth stations for future missions, it will, however, substantially reduce each individual mission's telecommunications capital budget by using the two European hub stations and the upgraded New York Earth stations.

60. Based on the number of peace-keeping missions established to date, it is projected that the 1992-1993 expenditures will amount to $29,520,000 for INMARSAT, national posts and telecommunications authorities and other leases.

The potential savings related exclusively to peace-keeping operations are estimated at $23,616,000.

C. Proposed funding for the satellite network

61. There are two possible methods of acquiring the Earth stations systems: (a) direct purchase of the Earth stations system and (b) lease arrangements with the vendor, with an option to buy. A lease arrangement is particularly attractive when the Earth stations are required for only a brief period of time. Lease charges are generally high. Typically, a vendor's lease charges are designed to recover the purchase price of the equipment over a period of 18 months to 2 years. Should the United Nations decide to lease the backbone satellite network for a period of two years, the estimated lease charges will amount to approximately $413,000 per month, or $9.9 million per biennium. As a result, the total lease charges will equal the purchase price over the two-year period. At the end of the two-year period the United Nations would still not own the equipment but would have an option to buy. Since the proposed satellite network is considered to be a long-term commitment on the part of the Organization, it would be more cost-effective to purchase the Earth stations at the time of installation in order not to incur the lease charges.

62. As shown in table 3 above, the major benefits of the estimated reduction in communications costs expected from the implementation of the proposed satellite network would be the budgets of peace-keeping missions. Accordingly, those budgets should make a significant contribution to the cost of installing and running the network. At the same time, the network would provide significant benefits for activities funded by the regular budget of the Organization, which are also likely to generate a more stable demand for telecommunications facilities than peace-keeping operations, whose requirements are inherently more difficult to predict and programme.

63. In the light of these considerations, the various cost elements of the implementation and operation of the network were reviewed. As shown in table 5 below, the estimated requirements for the 1994-1995 biennium amount to $18,212,700, of which $8,906,100 is recurrent and $9,306,600 is non-recurrent. Based on the cost-sharing arrangements proposed, the distribution of these costs would be $8,675,000 for the regular budget (of which $4,788,400 is recurrent and $3,886,600 non-recurrent) and $9,537,700 for the budgets of the peace-keeping missions (consisting of the one-time cost of the acquisition and installation of satellite Earth stations; additional satellite leases; and the contributions from the missions' budget for the 1994-1995 cost of additional staffing required). These proposals are set out below:

Table 4 (a). Estimated biennial project cost if the system were fully operational and proposed funding

(In thousands of dollars)

	Total biennial costs	Regular budget			Peace-keeping
		To be met from redeployment of existing resources	Income from telecommunications	Additional requirements	
RECURRENT					
Salaries and related costs	8 345.8	4 650.8	487.2	1 119.2	2 088.6
Satellite leases	3 643.8	510.0	-	121.5	3 012.3
Subtotal	11 989.6	5 160.8	487.2	1 240.7	5 100.9
NON-RECURRENT					
Earth stations:					
European hub: 2 stations	2 300.0	-	-	-	2 300.0
Addis Ababa	479.3	479.3	-	-	-
Bangkok	535.2	535.2	-	-	-
Santiago	570.1	-	-	570.1	-
Amman	397.7	-	-	397.7	-
Nairobi	579.3	-	-	579.3	-
New York (upgrade)	500.0	-	-	-	500.0
Site preparation	600.0	120.0	-	360.0	120.0
15 portable Earth stations	1 500.0	-	-	-	1 500.0
Subtotal	7 461.6	1 134.5	-	1 907.1	4 420.0
System integration and installation	1 755.0	-	-	755.0	1 000.0
Training	40.0	-	-	40.0	-
Travel	50.0	-	-	50.0	-
Subtotal	1 845.0	-	-	845.0	1 000.0
Total non-recurrent	9 306.6	1 134.5	-	2 752.1	5 420.0
TOTAL COSTS	21 296.2	6 295.3	487.2	3 992.8	10 520.9

Table 4 (b). Estimated additional recurrent biennial cost and savings under communications if the system were fully operational

(In thousands of dollars)

	Regular budget	Peace-keeping missions	Total expenditure	Projected savings a/	Net cost (savings)
Salaries and related costs	1 119.2	2 088.6	3 207.8	-	3 207.8
Satellite leases	121.5	3 012.3	3 133.8	-	3 133.8
Leased circuits (regular budget)				(1 764.0)	(1 764.0)
Commercial network (regular budget)				(1 261.0)	(1 261.0)
INMARSAT and national posts and telecommunications authorities (Peace-keeping)				(23 616.0)	(23 616.0)
Total	1 240.7	5 100.9	6 341.6	(26 641.0)	(20 299.4)

a/ See table 3 above.

Table 5. Proposed 1994-1995 funding for the enhanced network

(In thousands of dollars)

	Total biennial costs	Regular budget			Contribution from peace-keeping
		To be met from redeployment of existing resources	Income from telecommunications	Additional requirements	
RECURRENT					
Salaries and related costs	5 262.3	2 628.1	412.2	1 116.6	1 105.4
Satellite leases	3 643.8	510.0	-	121.5	3 012.3
Subtotal	8 906.1	3 138.1	412.2	1 238.1	4 117.7
NON-RECURRENT					
Earth stations:					
European hub: 2 stations	2 300.0	-	-	-	2 300.0
Addis Ababa	479.3	479.3	-	-	-
Bangkok	535.2	535.2	-	-	-
Santiago	570.1	-	-	570.1	-
Amman	397.7	-	-	397.7	-
Nairobi	579.3	-	-	579.3	-
New York (upgrade)	500.0	-	-	-	500.0
Site preparation	600.0	120.0	-	360.0	120.0
15 portable Earth stations	1 500.0	-	-	-	1 500.0
Subtotal	7 461.6	1 134.5	-	1 907.1	4 420.0
System integration and installation	1 755.0	-	-	755.0	1 000.0
Training	40.0	-	-	40.0	-
Travel	50.0	-	-	50.0	-
Subtotal	1 845.0	-	-	845.0	1 000.0
Total non-recurrent	9 306.6	1 134.5	-	2 752.1	5 420.0
TOTAL COSTS	18 212.7	4 272.6	412.2	3 990.2	9 537.7

Regular budget

64. Of the 54 posts required for the operation and maintenance of the Earth stations, it is proposed to meet from the regular budget the cost of 29 posts ($3,073,900): 1 P-5, 1 P-4, 1 P-3, 10 General Service (3 at the principal level) and 16 Field Service. In addition, provision would also be made under the regular budget for adequate technical expertise and support staff ($1,083,000) and a portion of the rental of satellite leases ($631,500). Non-recurrent requirements, estimated at $3,886,600, would be required for the installation of the satellite Earth stations at the regional commissions in Addis Ababa, Bangkok, Santiago, Amman and the United Nations Office at Nairobi ($2,561,600); the full cost of factory training and travel requirements ($90,000); and a share in the cost of site preparation and system integration and installation ($1,235,000).

65. Of the 29 posts proposed to be funded from the regular budget, however, it is estimated that the cost of 25 posts could be met either from within existing resources or through redeployments. These are as indicated below:

(a) One P-5 and one P-3 at New York would be met by redeployment of existing posts, within the existing establishment of the Electronic Services Division, to provide for the requirements of the project implementing team at Headquarters;

(b) At Europe, six General Service posts (one at the principal level) could be provided from existing posts in the Telecommunications Operations Unit at the United Nations Office at Geneva. The cost of the P-4 post would be met by the reclassification of an existing P-3 post to the P-4 level;

(c) Sixteen posts in the Field Service category would be met by the redeployment of field service telecommunications posts from the Field Operations Division for the operation of the satellite network.

In connection with the regular budget's share of the cost of satellite leases ($631,500), under existing contractual arrangements with INTELSAT, a provision of $510,000 is currently available under section 25D, Office of General Services. As to the non-recurrent requirements for the installation and related costs of the satellite Earth stations ($3,886,600), provisions for the satellite Earth stations at Addis Ababa and Bangkok ($1,134,500) have been included in the total project cost of the construction projects at those locations.

66. On that basis, the total additional costs during 1994-1995 under the regular budget have been estimated at $3,992,800, of which $1,240,700 is recurrent and $2,752,100 is non-recurrent. Provision for these costs has been included under sections 25D, Office of General Services; 25H, Administration, Geneva and 30, Construction, alteration, improvement and major maintenance of the Secretary-General's proposed programme budget for the biennium 1994-1995. Consequently, no additional resources are being proposed in the present report. Once operational, the system is expected to generate savings of $3,025,000 per biennium from reduced recourse to commercial networks and the rental of leased circuits.

67. In connection with income from telecommunications, estimated under Income section 2 of the proposed programme budgets of previous bienniums, the percentage share credited to General income was determined in 1978 when the United Nations telecommunications network consisted of leased commercial circuits, supplemented by United Nations-owned high-frequency radio teleprinter networks in a number of locations. All offices used the common public or commercial telephone and telex systems for the dispatch of communications to areas and offices not covered by leased circuits or high-frequency radio. Since that time, substantial investments have been made in upgrading the hardware and software associated with telecommunications services. Leased circuits have been upgraded to provide digital service whereby the Organization has substantially increased the capacity of its leased circuits, including the installation of a new telephone system in New York during the 1980s and those expected to be installed shortly in Europe, Addis Ababa, Bangkok and Nairobi.

68. The installation of the enhanced satellite network and improvements in the communication system would substantially reduce the requirements for rented equipment and facilities, which was, for the most part, used as the basis in determining the amount that was to be credited to Income section 2. However, in order to allow for the progressive development and operation of the global United Nations telecommunications network and be responsive to the needs of user organizations and at the same time maintain competitive rates with those of commercial carriers, it would be necessary to invest resources to provide for such expansion. Accordingly, it is proposed that as from 1994 all income from telecommunications be credited into a special account to be established for that purpose. Proposed expenditures from this account would be reviewed and approved by the General Assembly in the context of the review and approval of the proposed programme budget.

69. Once the capital investments to expand the network are completed, the income from the global telecommunications system should increase progressively with expanded usage by the specialized agencies and others in the common system. A sample survey conducted by the United Nations on system-wide telecommunications expenditures at 23 locations has revealed that approximately $40 million is spent for telecommunications and the overall system-wide expenditure for this purpose is estimated at over $100 million. There is a strong impetus, therefore, seriously to consider alternatives to the current commercial carriers facilities being used. Once the backbone satellite network is established, the global telecommunications network can be developed using the income from telecommunications as proposed above.

Peace-keeping missions

70. Since the peace-keeping missions would be the primary user and beneficiary of the European hubs in both the Atlantic Ocean and Indian Ocean regions and the upgrade of the Headquarters facilities is considered necessary owing to the continuing increase in peace-keeping activities, it is proposed to fund the installation of the satellite Earth stations and related costs, at the European hub and the upgrade of the New York facilities, in addition to the 15 portable Earth stations required by peace-keeping operations, from savings to be derived under the communications budget of the peace-keeping missions. Aside from the benefits and savings to be derived, which have been detailed in the preceding paragraphs, the total non-recurrent cost, estimated at $5,420,000, would also

eliminate the need to incur the capital cost of installing a hub Earth station (estimated at $500,000 each) every time a peace-keeping mission is established; or the rental of an Earth station, should an immediate need arise, which costs approximately $40,000 per month or $480,000 per annum.

71. Furthermore, as the operation and management of the Earth stations in each of the field offices would be primarily directed towards providing full support to the activities of the peace-keeping missions, it would appear appropriate that the managers of the telecommunications services units at those locations (proposed at the P-4 level) and the related local support staff be funded from contributions from the peace-keeping missions' budgets. The 1994-1995 recurrent requirements, including provisions for the peace-keeping missions' share of the cost of the satellite leases, are estimated at $4,117,700.

72. Compared to the estimated savings in the communications costs of those missions amounting to approximately $23.6 million, the estimated contribution from peace-keeping missions' budgets amounts to approximately $9.6 million. Once these Earth stations have been installed, the communications requirements for each peace-keeping mission could be drastically reduced.

VI. SUMMARY AND PROPOSALS FOR 1994-1995

73. As indicated in paragraph 63 above, the 1994-1995 requirements for the implementation of the satellite Earth stations are estimated at $18,212,700, of which $9,306,600 is non-recurrent and $8,906,100 is recurrent. Of the total non-recurrent requirements, $3,886,600 would be borne by the regular budget. Provisions of $1,134,500 relating to the cost of the satellite Earth stations at Addis Ababa and Bangkok have already been included in the total cost of the construction projects at Addis Ababa and Bangkok. Provisions for the Earth stations at Santiago, Amman and Nairobi, including the regular budget's share of the related costs, estimated at $2,752,100, have been requested under section 30 (Construction, alteration, improvement and major maintenance) of the proposed programme budget for the biennium 1994-1995. The 1994-1995 contributions required from peace-keeping missions for non-recurrent requirements, estimated at $5,420,100, relate to the satellite Earth stations for the European hub, the upgrade of the Earth station at New York, 15 portable Earth stations and related costs.

74. The total recurrent requirements have been estimated at $8,906,100, of which $4,376,200 would be funded from the regular budget and $412,200 from income from telecommunications. It is, however, estimated that approximately $2,628,100, related to the cost of posts indicated in paragraphs 64 and 65 above, could be met from the regular budget under existing telecommunications infrastructure and $510,000 from provisions in the regular budget under existing lease arrangements with INTELSAT. It is further anticipated that expenditures under rental of leased circuits could already be reduced by $578,800 in 1994-1995. The net recurrent additional costs for the biennium 1994-1995 under the regular budget are thus estimated at $659,300 for which net provisions have been requested under section 25D, Office of General Services ($625,700) and 25H, Administration, Geneva ($33,600) in the proposed programme budget for the 1994-1995 biennium. This would also require that provisions under Income section 2 relating to reimbursement for telecommunications services provided to

specialized agencies and others be deleted. The peace-keeping missions' share of the 1994-1995 recurrent costs are estimated at $4,117,700.

75. When the system becomes operational, it is anticipated that biennial communications expenditures under the regular budget would amount to $9.5 million as compared to $12.5 million and that, in respect of peace-keeping operations, current biennial expenditures for communications, $29.5 million, would be reduced to $9.5 million. On that basis, it is estimated that the one-time cost of the acquisition and installations of the Earth stations could be recovered within a year from savings under communications requirements of both the regular budget and the budgets of peace-keeping missions. As to the recurrent requirements for peace-keeping missions, they would be substantially less than they currently are.

76. The approval of the General Assembly is therefore sought (a) to proceed with the implementation of the proposed network, (b) to utilize appropriations under communications in the budgets of peace-keeping missions as contributions by these missions to the cost of the network and (c) to credit telecommunications income to a special account that would be established to provide for expenditures related to the progressive development of the global United Nations telecommunications network. Related requirements under the regular budget have been included under the respective sections of the proposed programme budget for the biennium 1994-1995.

Annex I

COMPARISON OF TELEPHONE RATES

Calls originating in New York

(Standard rates)

Destination	Published commercial rates 1 minute	Special United Nations volume discounts 1 minute	United Nations network rate 1 minute
Angola	3.98	2.08	0.85
Ethiopia	3.12	1.77	0.85
Somalia a/	4.91	8.41	0.85
Kenya	2.71	1.45	0.85
Iraq	3.46	1.85	0.85
Israel	2.98	1.55	0.85
Kuwait	3.19	1.46	0.85
Lebanon	3.23	3.23	0.85
Syrian Arab Republic	2.95	1.58	0.85
Cyprus	2.23	1.20	0.85
Thailand	3.96	1.80	0.85
Pakistan	4.45	2.02	0.85
Cambodia	N/A	N/A	0.85
Austria	1.83	0.89	0.85
France	1.71	0.74	0.85
Switzerland	1.94	0.86	0.85
Chile	2.27	1.09	0.85
El Salvador	2.25	1.21	0.85

Source: General commercial rate based on AT&T International Telecommunications Guide 1/92.

a/ Operator assisted - no direct dial.

Annex II

COMPARISON OF SAMPLE TELEX RATES

PTT/Commercial Carrier
vs
United Nations network

(Charges per minute)

					New York	
From to	Ethiopia	Thailand	Chile	Switzerland	Commercial	UNNET
Angola	1.89	2.77	3.52	2.51	2.03	1.20
Ethiopia		2.77	3.52	2.51	2.03	1.20
Somalia	1.42	2.77	3.52	2.51	2.07	1.20
Kenya	0.7	2.77	3.52	2.51	1.64	1.20
Cyprus	1.42	2.77	2.64	0.46	1.39	1.20
Iraq	1.89	2.37	3.52	2.51	1.64	1.20
Israel	1.42	2.37	3.52	1.32	1.64	1.20
Kuwait	1.89	2.37	3.52	2.51	1.64	1.20
Lebanon	1.89	2.37	3.52	1.32	1.43	1.20
Syrian Arab Republic	1.89	2.37	3.52	1.32	2.03	1.20
Austria	1.42	2.77	2.64	0.4	1.39	1.20
France	1.42	2.77	2.64	0.4	1.39	1.20
Switzerland	1.42	2.77	2.64		1.39	1.20
United Kingdom of Great Britain and Northern Ireland	1.89	2.37	2.64	0.46	1.07	1.20
Chile	1.89	2.77		2.51	1.66	1.20
El Salvador	2.36	2.77	2.64	2.51	1.66	1.20
New York	1.89	2.37	2.64	1.32		
Cambodia	N/A	N/A	N/A	N/A	N/A	1.20
Pakistan	1.89	1.98	3.52	2.51	1.43	1.20
Thailand	1.89		3.52	2.51	2.02	1.20

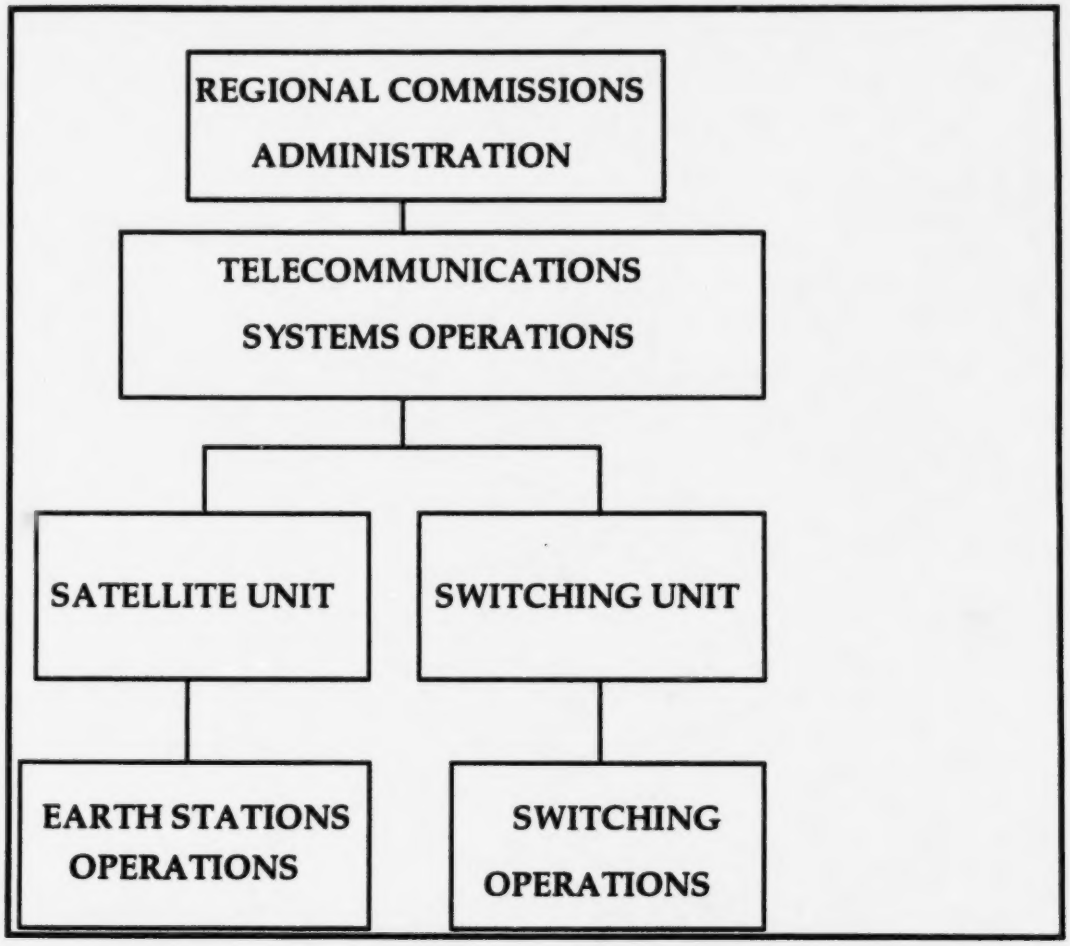
(Notes on the following page)

(Notes to table)

Notes: N/A Commercial telex not available at this time. Dollars conversion per United Nations operational rates of exchange for United Nations programmes. National posts and telecommunications authorities rates based on World Telecommunications Tariff Directory, volume 5. UNNET rate of $1.20 per minute based on IMX billing charges of $0.02 per word at 60 wpm.

Annex III

PROPOSED ORGANIZATIONAL STRUCTURE MODEL FOR TELECOMMUNICATIONS SECTION AT REGIONAL COMMISSIONS AND NAIROBI



Annex IV

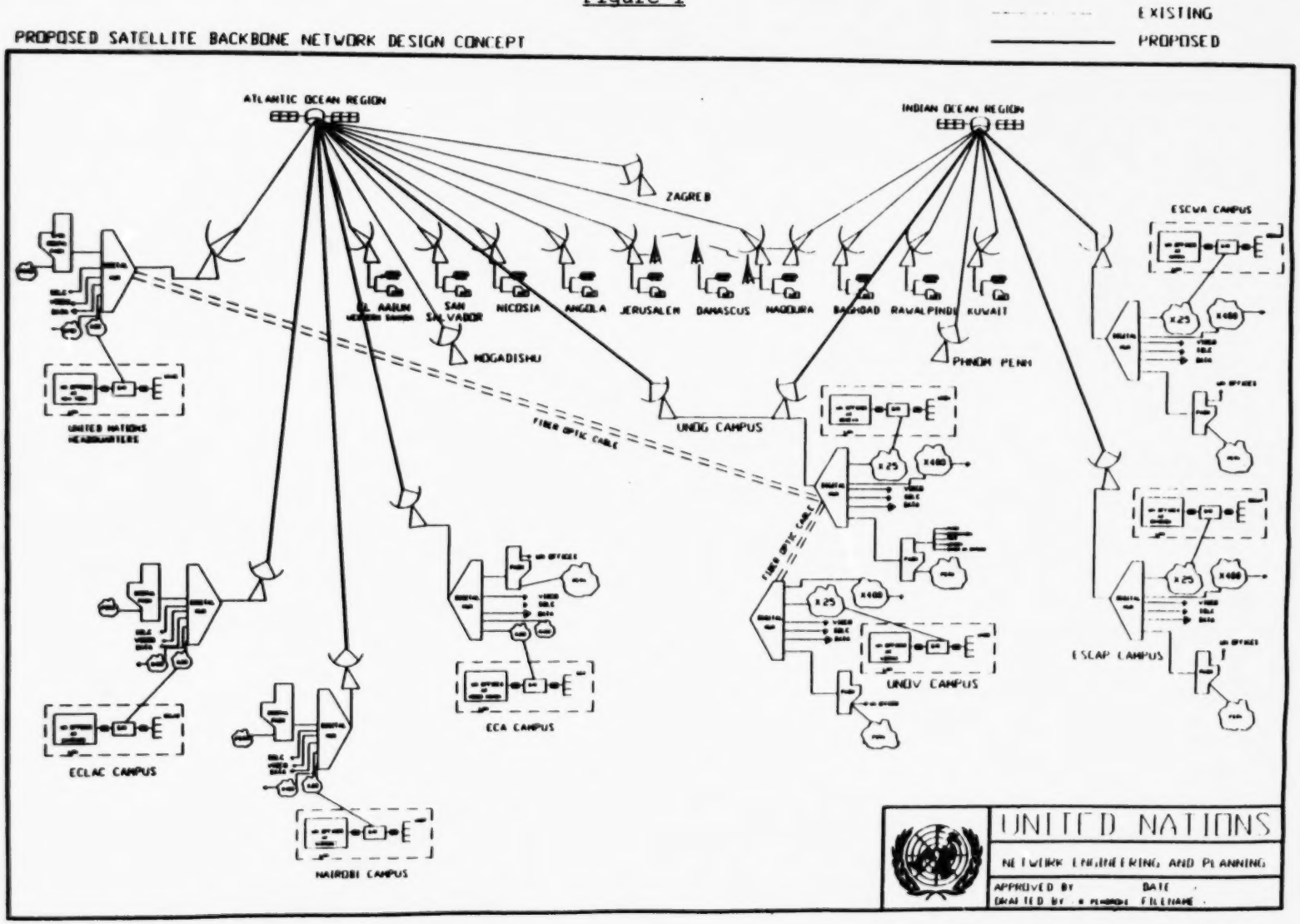
EXISTING 1992-1993 LEASED CIRCUITS (LINES) AND PROPOSED CONFIGURATIONS

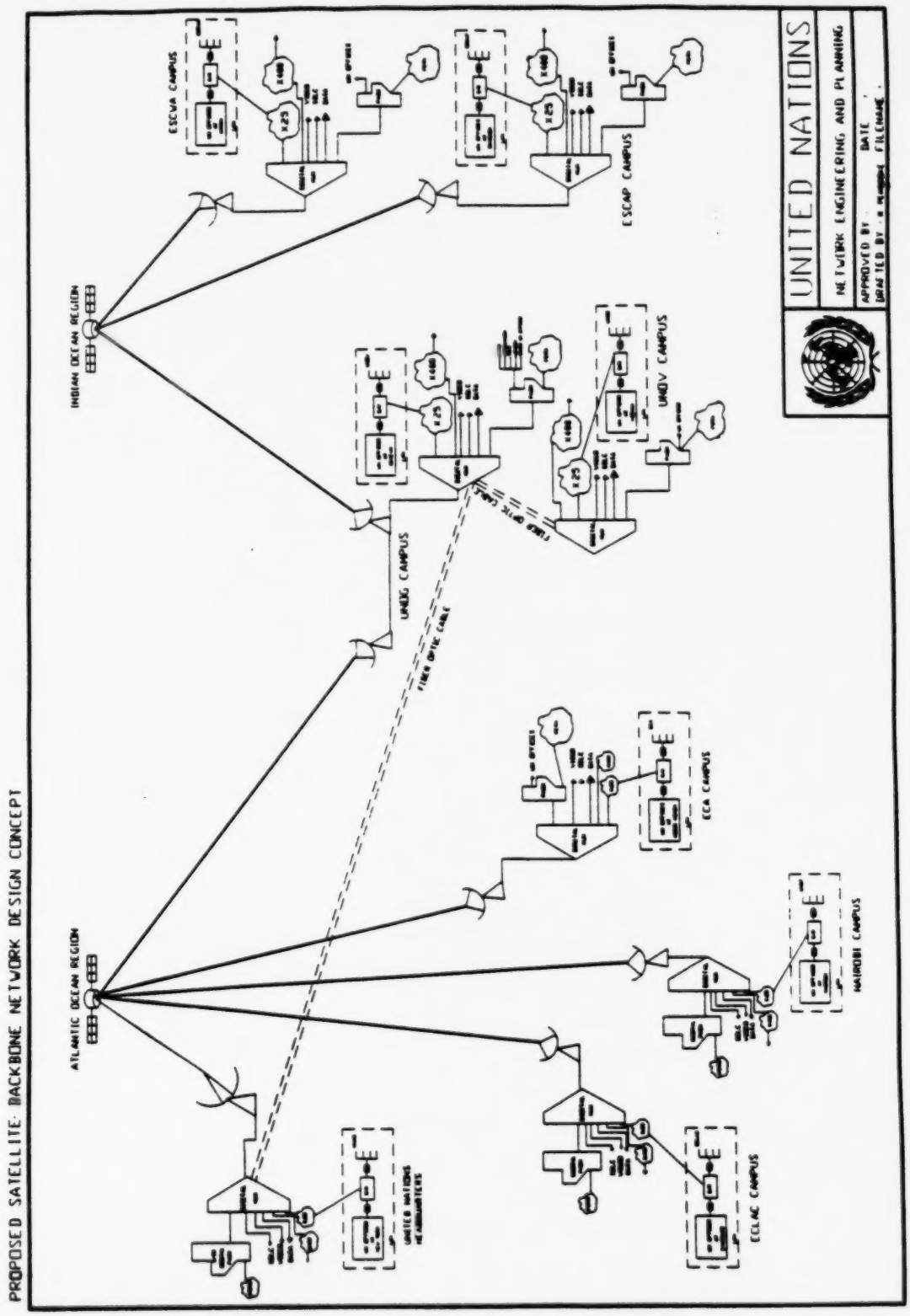
UNITED NATIONS LEASED CIRCUITS

EXISTING CONFIGURATIONS						PROPOSED CONFIGURATIONS						
TWO-WAY CIRCUITS			CHARGES (In US$)			TWO-WAY CIRCUITS			CHARGES (In US$)			Estimated biennial savings in leased lines
FROM	TO	Unit	United States	Foreign	Biennium totals	FROM	TO	Unit	United States	Foreign	Biennium totals	
Addis Ababa	NY	2	4 820	8 904	329 376							329 376
Bangkok	NY	1	2 680	10 198	309 063							309 063
Nairobi	NY	1	2 410	3 677	146 095							146 095
Santiago	NY	1	3 400	5 600	216 000							216 000
Vienna	NY	2	3 020	14 595	422 750							422 750
Subtotal	NY	7	16 330	42 974	1 423 284							1 423 284
Geneva	NY	2	6 040	13 685	473 408	Geneva	NY	1	3 020	6 843	236 712	236 696
						Vienna	Geneva	1		6 843	164 232	-164 232
Copenhagen	NY	1	3 020	11 216	341 667	Copenhagen	Geneva	1		11 216	269 184	72 480
Paris	NY	1	3 020	7 815	260 035	Paris	Geneva	1		7 815	187 560	72 480
Rome	NY	1	1 510	9 498	264 200	Rome	Geneva	1		9 498	227 952	36 240
London	NY	1	1 510	3 597	122 571	London	Geneva	1		3 597	86 328	36 240
Network management equipment					520 200	Network management equipment					520 200	50 800
SUBTOTALS		6	15 100	45 812	1 982 081			6	3 020	45 812	1 171 968	340 704
TOTAL		13	31 430	88 785	3 405 366			6	3 020	45 812	1 171 968	1 763 988
Satellite capacity leased					510 000							
TOTAL, leases					3 915 366							
Less UNICEF Copenhagen line					341 667							
TOTAL, regular budget					3 573 699							

Figure 1

PROPOSED SATELLITE BACKBONE NETWORK DESIGN CONCEPT




PROPOSED SATELLITE BACKBONE NETWORK DESIGN CONCEPT
UNITED NATIONS
NETWORK ENGINEERING AND PLANNING
APPROVED BY
DATE
DRAWED BY
FILENAME
ATLANTIC OCEAN REGION
INDIAN OCEAN REGION
ESCWA CAMPUS
ESCAP CAMPUS
UNECA CAMPUS
UNOV CAMPUS
ECA CAMPUS
NAIROBI CAMPUS
ECLAC CAMPUS
UNITED NATIONS HEADQUARTERS
FIBER OPTIC CABLE

UNITED
NATIONS

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PROPOSED PROGRAMME BUDGET FOR THE BIENNIUM 1994-1995

Integrated management information system

Fifth progress report of the Secretary-General

INTRODUCTION

1. The General Assembly, by its resolution 43/217 of 21 December 1988, approved the implementation of phase I of the integrated management information system (IMIS) at a total cost not to exceed $28 million at 1988 rates. Details of the Secretary-General's proposal for the project are contained in his report to the General Assembly at its forty-third session 1/ and in the related report of the Advisory Committee on Administrative and Budgetary Questions (ACABQ). 2/ The purpose of the project is to develop an integrated system for the processing of, and reporting on, administrative actions at all major duty stations. This system will replace the numerous independent computer programs at Headquarters and other duty stations, many of which were written up to 25 years ago and mostly for regular budget activities. These systems are no longer able to provide the controls needed by management at a time of rapidly changing needs and increasing demands made on the administrative sector to support peace-keeping activities and those financed from extrabudgetary resources. IMIS will also provide duty stations away from Headquarters with tools not currently available to support their administrative needs.

2. The Secretary-General has since submitted four progress reports, in 1989, 3/ 1990, 4/ 1991, 5/ and 1992. 6/ The first progress report provided information on the general work plan for the first phase of the project. In his second progress report, the Secretary-General described the progress achieved in 1990. It also provided a detailed analysis of the benefits to be derived in each of the major administrative areas. The main activity during that year was the detailed analysis of user requirements in the Finance, Human Resources and General Services areas.

3. The third progress report described the progress achieved in 1991, the plans for the period mid-1991 to 1993, an analysis of the expenditures and a further elaboration on the expected benefits. The fourth progress report provided information on the work accomplished in 1992, details on the expected benefits to be derived from the implementation of the system, a list of systems to be replaced by IMIS and a revised cost estimate for the project.

4. In 1992, in accordance with General Assembly resolution 46/185, part B, section IV, paragraph 6, a panel of independent experts evaluated the IMIS project. As mandated, the report of the Panel was submitted to ACABQ, which reviewed it in conjunction with the fourth progress report of the Secretary-General. It contained a review of the technology, an assessment of the management of the project, a detailed description of the progress of work since October 1991, the work plan until the completion of the project, the expected benefits and estimated costs for the entire project and management consideration for the maintenance of the system after its implementation. The executive summary of this independent evaluation was annexed to the ninth report of ACABQ at the forty-seventh session of the General Assembly. 7/ The experts' conclusions were very positive with regard to the way the project had been managed from both a technical and an administrative point of view. They also drew the attention of the Organization to the tasks that had to be accomplished to ensure the successful implementation of the system, notably the training of staff.

5. The present report provides information on the progress of work to date, the successful implementation at Headquarters of the first release of the system, the progress of work since the end of 1992 and the difficulties encountered. The revised cost estimate of the project and estimated maintenance costs for the next biennium are provided in document A/46/6 (Section 29) as part of the proposed programme budget for 1994-1995.

I. PROGRESS OF WORK AND WORK PLAN UNTIL MID-1995

A. Release 1 implementation at Headquarters

6. A first series of applications related mainly to the human resources area was successfully implemented at Headquarters on 24 September 1993 (see para. 9 (a) below). Almost 400 users in executive offices, in the Office of Human Resources Management, in the Field Operations Division and in the Office of Programme Planning, Budget and Finance started working on the system as of that date, completing transactions, updating records or simply inquiring data. The introduction of a new system is always problematic. Although difficulties have been encountered, they were all relatively minor as compared to the size of the applications implemented and taking into consideration the large number of users who were confronted with a completely new technology and change in administrative procedures.

7. After the first weeks of operation, both the system and the technical infrastructure have proven to be extremely stable. The IMIS team, with the help of the training team, provided extensive support to the users to help them to overcome the difficulties encountered. These difficulties related mainly to the data converted from existing systems (some records were not complete or up to

date) and to the ongoing reorganization of the Economic and Social Departments. A users' group with representatives of all user offices was established and meets regularly with the IMIS team and Electronic Services Division staff to review issues and be briefed on solutions or improvements already made to the system.

B. Training

8. The success of the implementation of the first release was also due, to a large extent, to the training strategy adopted by the Organization. After reviewing the various alternatives available, it was in fact decided to supplement traditional training courses with modern tools geared specifically to training in computer systems. The key elements of this strategy are: (a) maximum reusability of the training material at all duty stations after completion of the training programme at Headquarters; (b) easy maintenance of the training material and tools since they are fully integrated with the system; (c) availability of a self-study training programme integrated with the system.

9. The training programme for IMIS is composed of the following elements:

(a) Four types of training courses:

(i) Six video courses, one providing a general overview of the system and five providing more specific information on the contents of each release. Two were produced for release 1;

(ii) Thirteen instructor-led courses, which aim at introducing new concepts such as the new accounting code structure. Four were developed for release 1;

(iii) One computer basics course that aims at familiarizing users with IMIS operations. This course was developed for release 1;

(iv) Eighty-two initial implementation courses for "hands-on" practice of the various types of transactions that can be processed with IMIS. Each course comprises a general overview of the subject and practical exercises. The training booklets given during the classes are designed to be usable also for self-study training. Seventeen courses were developed for release 1;

(b) A system of on-line help composed of screens that are designed to provide various levels of information, starting with basic information on the scope of the system or of the application being used and allowing the users to choose to view more detailed information as required up to the level of fields;

(c) Desk procedures, which provide details on the entire procedure to be followed for performing given transactions. They cover not only navigation within IMIS (which screens to call for each transaction, for example) but also the procedures outside of IMIS before and after accessing the system. They constitute in fact a "procedural manual" which will cover all the transactions performed through IMIS, ensuring consistent procedures throughout the Secretariat. It is the first time that such a comprehensive manual is

available. The desk procedures developed for release 1 comprise 126 procedures in the human resources area, 34 in the finance area and 30 in the geographic locations area;

(d) Job aids, consisting of a fast reference tool and listing by subject-matter which screens need to be accessed to perform a specific transaction;

(e) A practice database accessible on line by all users both before and after the initial implementation of IMIS to enable current and future users to practice using the training material developed.

10. Two dedicated training rooms with a total of 32 workstations and projection facilities were established. The training courses for release 1 started at the end of June and continued until two weeks after the implementation of release 1. More than 400 staff attended the training programme for release 1. The training has been jointly managed by the Office of Human Resources Management Training Service and the IMIS project team.

C. Implementation schedule

11. In view of a number of difficulties that were encountered and which are described below in more detail, the Organization reviewed the implementation schedule of the system. It was decided that the quality of the software had to be given priority over the meeting of deadlines and a new implementation schedule was established:

(a) Release 1 (September 1993): Authorization and transaction controls, personnel and posts database for staff administered at Headquarters, new accounting coding structure, processing of personnel actions;

(b) Release 2 (January 1994): Processing of staff entitlements and of applications for employment, medical insurance enrolment;

(c) Release 3 (May 1994): Expenditures controls, which include general ledger, funds distribution and execution, accounts payable, requisitioning and cash control, accounts receivable, banking and cash management, travel and transportation, leave and attendance; recruitment and administration of consultants and other non-staff personnel; stock and property management, purchasing;

(d) Release 4 (August 1994): Payroll. The old system will run concurrently until the new system is fully tested in the production environment. This precaution, which is generally done only for payroll systems, is to ensure 100 per cent accuracy before the old system is cut off;

(e) Release 5 (October 1994): Complete integrated budget, investment modules, specialized office automation support including electronic data interface (for banking transactions).

12. The major change in the implementation strategy concerns the move of the expenditures control module from release 2 to release 3. Although the module will be ready at the time of implementation of release 2, it has been moved to

release 3 to avoid introducing a major change at a time when all staff resources in finance are mobilized for the closing of accounts and to ensure the integrity of the accounts for 1992-1993. The volume of data that would have had to be converted and the complexities of the changes that have taken place during the current biennium in the account codes as a result of restructuring were the main considerations that led to this change. The records concerning the financial transactions that will have occurred between January and May 1994 will be converted into IMIS.

D. System construction

13. The main reason for adjustments to the implementation plan is to ensure that the system fully meets the Organization's requirements, in particular in terms of control and financial reporting, and to ensure that proper technical support is available once the system has been implemented.

14. One of the many benefits of the project comes from the fact the system forced the Organization to reconsider, review and, whenever possible, harmonize existing procedures and rules which were, until this project, rarely reviewed in their totality. By bringing together various elements, the construction, i.e. coding, of the system has brought to evidence issues and inconsistencies that needed to be addressed. The automation of these procedures also requires their rationalization in order to ensure their global applicability and to limit the processing of exceptions, which are currently performed manually and are difficult to monitor.

15. The detailed review of the screens for the first two releases with staff members from the major duty stations that took place in June 1992 brought to light some of these issues. Others were added during the actual construction of the system. They made necessary a more detailed review and analysis of selected issues than had been expected.

16. Additional studies had therefore to be performed in particular in the area of accounting, mainly concerning technical cooperation and peace-keeping funds, and treasury before the completion of the actual construction of the first two releases; these requirements could not have been foreseen prior to the actual construction of these releases.

17. In the accounting area it became apparent that current reporting procedures for technical cooperation activities could not be modified to conform to those used elsewhere in the Organization essentially because of the requirements of the United Nations Development Programme (UNDP). This also required an additional analysis of the posting rules concerning this type of activities.

18. Further discussions were held regarding funds sufficiency checking in all accounts and cash pooling. With the introduction of the latter, the number of bank accounts presently used by Headquarters will be drastically reduced and cash will be pooled, allowing for better investment opportunity.

19. Further to these analyses, it was determined that these additional functions needed to be incorporated into the system under development to ensure that it would closely meet United Nations requirements. This led to additional

development costs and related changes in the implementation schedule. A review of the literature on the development of large systems indicates that such events are bound to occur and are part of a normal development process.

20. The thorough testing of release 1 also led to the identification of enhancements that were required, mainly in the human resources area and which became apparent to users only when the actual work was simulated during the testing.

21. The conversion of human resources data from six different existing systems was also more difficult than foreseen. IMIS has been designed with very strict logic and controls built in not only for data integrity but also to ensure that the system will be able to process fully retroactive actions. This resulted in a large proportion of the data processed being rejected and in the need to re-verify, complete and, most often, manually clean the data.

22. These new activities have been undertaken at a time when many important changes were taking place with regard to the restructuring of the Secretariat, including the redeployment of posts from administration to other areas of the Secretariat. In fact, some of the implementation activities were performed by contractors under the supervision of the IMIS team. However, notwithstanding these difficulties, release 1 was completed in January 1993. The system test was tested for three months with the participation of more than 100 users. Representatives of the Internal Audit Division attended the large majority of the test sessions.

23. The enhancements to the system that were identified as urgently needed during the testing were completed during the period June to July 1993 and tested in August.

24. In parallel, four "bridges" between IMIS and the current systems that will be phased out progressively to ensure synchronization and consistency of data were also developed and tested. They are:

(a) IMIS payroll bridge. This bridge will facilitate the comparison of the data in IMIS and in the current payroll to ensure that, when the new payroll is to be implemented, the records contained in these two systems will be consistent;

(b) Account code structure crosswalk. This bridge was made necessary by the fact that, until all financial transactions at all duty stations are performed using IMIS, there will be the need to maintain in parallel the current account code structure as well as the new one developed within the framework of IMIS;

(c) Budget post database. To ensure proper control, the staffing table function will continue to be performed in the current system until release 3 when funds control will be introduced in the system;

(d) Personnel data bridge. Information on the staff members working at the other duty stations will continue to be maintained in the office of Human Resources Management database until IMIS has been implemented at all these duty stations. It was therefore necessary to transfer data from IMIS into the OHRM

database to enable the Organization to continue producing reports for the Organization as a whole.

25. The construction of the applications that were initially foreseen to be implemented in release 2 (personnel entitlements, applications processing and expenditures control) has also been completed. This includes the coding of all the entitlements in the expert system that will determine the eligibility on the basis of the situation of each individual staff member. 8/

26. The testing of the applications to be implemented in January 1994 started in August 1993. The testing of the other applications that have already been completed will be undertaken early in 1994.

27. The design of the applications to be implemented in release 3 has also been completed. It includes prototype screens in electronic format, a definition of the edits and validations that will be included (to verify the consistency of the data and to generate error messages if necessary) and a description of the data elements included in the release.

28. The posting of the financial transactions to the appropriate ledgers will be automated as a part of release 3. Approximately 3,500 different "posting rules" have been identified and are currently being programmed.

E. Technical infrastructure and support

29. Four powerful mini-computers were installed in January 1993 and have been extensively tested since then. To access these computers, each workstation must be connected to a local area network (LAN) server. Twenty such servers have been established and configured with the necessary software to access IMIS. At the end of September 1993, about 500 workstations were connected to the system, including those needed for training and development.

30. Disaster recovery procedures have been established. The data on the database server are copied on a regular basis and a mini-computer currently used for development has been configured to support the functioning of the most required applications, such as payroll, should a major catastrophe prevent any operation in the Secretariat building.

31. The network established for IMIS is part of a larger network to be used to connect all the workstations in the Secretariat buildings. The same infrastructure is already being used for other applications; for example, while configuring the LAN servers for IMIS, the new electronic mail system is also being installed.

32. As of mid-October, the Electronic Services Division has assumed responsibility for the day-to-day operations of IMIS. This includes monitoring the LAN over which IMIS runs, managing the production database, and maintaining the operating system software on the various UNIX servers which are interconnected to house the IMIS programs and data.

33. The Electronic Services Division has also assumed full responsibility for IMIS security. This involves reviewing requests by offices to register new IMIS

users to perform selected administrative functions. A number of procedures have been set up to ensure that only authorized individuals can have access to that portion of the database which their daily work requires.

34. Early in 1993, the Electronic Services Division assumed a new organizational structure which better enables it to support the changing technological needs of the Organization, including IMIS. Additional training was given to regular Professional staff, and fully trained technical support personnel were also hired through the Electronic Services Division outsourcing programme. The Division has also consolidated its help-desk operation to allow users to call one single telephone number for any type of computer-related problem, whether it relates to equipment, software or LANs.

F. System maintenance and users' support

35. The introduction of IMIS with hundreds of users linked to the same system and very complex applications being made available on line required the development of a completely new strategy for users' support and system maintenance.

36. The ownership of the system will initially be divided between the Office of Human Resources Management, the Office of Programme Planning, Budget and Finance and the Office of General Services. Each Office will be responsible for the maintenance work of the applications related to its own area, the users' support material and tools and the substantive help-desk functions, in cooperation with the central help desk, which is under the responsibility of the Electronic Services Division.

37. The main functions assigned to these units are the following:

(a) Maintenance of the software;

(b) Related updating of the on-line help screens, the training material and other users' and system documentation;

(c) Help-desk activities to provide assistance to the users for IMIS related issues;

(d) Maintenance of other systems related to the activities of each Office until these are phased out subsequent to the completion of IMIS implementation;

(e) Assistance to offices away from Headquarters for the implementation of the system.

38. Until the completion of the development work and of the implementation of the system at offices away from Headquarters, the IMIS activities within the Department of Administration and Management will be coordinated by the IMIS team. In this way the necessary integration of the various functions will be ensured.

G. Offices away from Headquarters

39. Offices away from Headquarters have continued to be kept informed of the activities of the project through progress reports and correspondence on specific issues. It should be noted in this connection that all the preparatory work and all the tools that have been developed at Headquarters will be used, sometimes with minor modifications, at these offices.

40. In order to enable the users at these offices to familiarize themselves with the system, the IMIS electronic screens were ported to a format that permits their installation on personal computers. Copies of this program were sent to all Offices. Similarly, an electronic program containing all the technical specifications of releases 1 and 2 were sent to all technical focal points. A copy of all the training material prepared for release 1 was also sent to each office.

41. It was also decided to install, possibly before the end of the current year, at each major duty station a small server configured for IMIS and containing the software of releases 1 and 2. This server will enable each office to get better acquainted with the technology used by IMIS and to start testing the local technical environment. In addition, interested users, referring to the training documentation, will be able to practice on the system, thus creating locally a first group of advanced users who could then play an important support role at each duty station.

42. The validity of this approach needed to be tested before proceeding to the purchase of the hardware for all the duty stations. A server and release 1 software were successfully installed at the United Nations Office at Geneva in July. The software was also installed at the Office of the United Nations High Commissioner for Refugees (UNHCR) and at the International Labour Organization (ILO), in the latter case on a different platform, thus enabling the project team to evaluate the portability of the system.

43. The recruitment procedure for the local coordinators was also initiated and it is expected that they will all report during the first quarter of 1994. The coordinator for Geneva was appointed in July 1993.

44. The experience gained at Headquarters with the conversion of data for IMIS has also led to the cleansing of data maintained at Headquarters concerning staff at the other offices. In November 1993 data conversion activities concerning these offices will be initiated. An inventory of the data available will be conducted as a first step. Test data will be requested and run through the conversion processes at Headquarters to identify precisely possible difficulties in the data conversion. Equally, plans will be established with each office for the collection and entry of data in the appropriate format and on the appropriate support.

45. The existence of a server and of the software at each duty station will greatly facilitate this preparatory work. Concerning the deployment of the system at these offices, it is planned to install the entire human resources applications at all duty stations during the second half of 1994, while the financial applications would be installed during the first half of 1995.

46. The success of the installation of the test/training server in Geneva also confirmed the fact that IMIS can subsequently be deployed at mission sites.

47. Finally, representatives of each office were invited to the review of the external design of release 3 in New York at the beginning of October. This review gave them an opportunity to view the actual operational release 1 and to be briefed on the major changes made to the software for releases 1 and 2 subsequently to their visit in June 1992. This review was also attended by UNDP, the United Nations Children's Fund (UNICEF) and UNHCR representatives.

H. Interest in the system by United Nations programmes and other organizations

48. ILO and UNHCR are actively working on the customization to their specific needs of the human resources applications contained in releases 1 and 2. They expect to introduce this part of the system in the course of 1994.

49. UNDP has began an analysis of the system and of possible customization, should this be required. The software for the first release will be installed at UNDP for testing and training purposes by the end of October 1993.

50. The International Civil Aviation Organization (ICAO) pursued its active review of the system, begun in 1992. It is currently planning to install a basic infrastructure for the installation of the IMIS software for testing and review with the users.

51. The United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO), the United Nations Industrial Development Organization (UNIDO), the International Atomic Energy Agency (IAEA) and the Inter-American Development Bank (IDB) staff visited New York to acquire first-hand knowledge of the system, particularly the human resources applications. They have been provided with detailed technical and functional documentation so that they can continue their analysis locally with the users and they are kept informed of the progress of work. Other organizations have requested detailed information on the system being developed.

I. Cost of the project

52. The revised detailed budget estimates of the project are contained in document A/48/6 (Section 29).

53. These estimates show a growth with respect to those submitted in the fourth progress report. This is due principally to the following factors:

(a) The increase in actual costs for consultancy services as a result of the additional functions that had to be added to the system as described in paragraph 19 above, and to the need to obtain assistance for the implementation of the system as described in paragraph 22 above;

(b) The higher than foreseen costs related to the development of the training programme and to the actual training of staff. It should be noted however that the programme, as developed, will reduce to a minimum the need to maintain a permanent training structure for IMIS;

(c) The foreseen delayed completion of the project, with the related increase in staff costs.

54. Additionally, provision is proposed under the regular budget for maintenance costs distinct from the project costs for phase 1 of IMIS.

55. It should be recalled that, as pointed out by the independent experts in their report to ACABQ, the project bears little resemblance to that originally planned in 1988. While originally the project was limited to the customization of a software developed by the Food and Agriculture Organization of the United Nations (FAO) in a traditional mainframe environment, it evolved into the design and development of a completely new system based on the most up-to-date technology. The scope of the first phase of the project had also to be expanded to encompass part of the functions initially foreseen for subsequent phases. 9/

56. It is to be considered however that the experience of the United Nations and of FAO in this area is common to that of many other public and private entities that established large computerized systems. In its report to the twenty-seventh session of the FAO Conference in late 1993, for example, the External Auditors indicated that

> "Escalating costs are a feature of many large computerization projects and the Organization's experience is not unique. In addition, although the total expected cost is significantly greater than originally envisaged, it represents a relatively small proportion of the total regular budget expenditure over the period the new system was being developed." 10/

The same comments may apply to the United Nations experience concerning IMIS.

57. Finally, it should be noted that the usage of the system by UNHCR, ILO and UNDP represents by itself a net saving for the member countries that can be estimated at an amount higher than the expected costs of the IMIS project. The possible adoption of the system by other organizations will increase even further the savings member countries will derive from the IMIS project, not only in terms of development costs but also in terms of long-term maintenance.

Notes

1/ A/C.5/43/24.

2/ Official Records of the General Assembly, Forty-third Session, Supplement No. 7 (A/43/7/Add.10).

3/ A/C.5/44/8.

4/ A/C.5/45/20.

5/ A/C.5/46/24.

6/ A/C.5/47/27.

7/ A/47/7/Add.8.

8/ A/C.5/46/24, para. 18.

9/ A/C.5/47/27, annex III.

10/ FAO Conference, Twenty-seventh Session, Financial report and statement, Volume I, Regular programme 1990-1991 (C 93/5 September 1992, para. 126).